REMARKS

The foregoing amendments are responsive to the May 16, 2003 Office Action. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Response to Objection to Claim 46

The Examiner objected to Claim 46 for the following informalities: the phrase "a transform a second time-domain" should read "transform a second time-domain." Applicants have amended Claim 46 as requested by the Examiner. Applicants request allowance of Claim 46.

Response to Rejections to Claims 31-33, 37-39 and 45 Under 35 U.S.C. 102(b)

The Examiner rejected Claims 31-33, 37-39 and 45 Under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,911,167 to Corenman et al. Corenman teaches that the pulserate can be found by "searching the frequency spectrum in the region of expected heart rates for a relative maximum and insuring that this is the fundamental by determining the existence of another relative maximum at twice this rate." (Column 12 at lines 7-12.) Corenman teaches away from using more spectral lines because "only two spectral lines are of interest, the zero spectral line corresponding to the zero frequency background intensity and the N spectral line corresponding to the number of heartbeats for the data set, the Fourier Transform need only be made at the two frequency components and not of the entire spectrum, and the computational efforts required by the microprocessor are significantly diminished." (Column 13 at lines 7-15). Thus, Corenman does not teach or suggest identifying and categorizing three or more spectral lines as fundamental, harmonics, etc.

Regarding Claim 31, Corenman does not teach or suggest a signal processor configured to transform a time-domain plethysmograph dataset into a spectral-domain dataset, identify three or more spectral peaks in the spectral domain dataset, and sort the three or more spectral peaks according to one or more rules into one or more spectral peaks corresponding to a fundamental frequency and one or more harmonics of the fundamental frequency, and estimate a pulserate from the fundamental frequency and the one or more harmonics.

Regarding Claim 32, Corenman does not teach or suggest the physiological monitor of Claim 31, wherein the rules include comparisons of relative magnitudes of one or more of the spectral peaks.

Regarding Claim 33, Corenman does not teach or suggest a physiological monitor for measuring a pulserate of a living being, the monitor having a detector producing a detector output waveform corresponding to a time-domain plethysmograph waveform, a method that includes transforming a time-domain plethysmograph waveform into a spectral domain waveform, identifying three or more spectral peaks in the spectral domain waveform, classifying the three or more spectral peaks into a first group of one or more spectral peaks corresponding to a fundamental frequency and a second group of one or more harmonics of the fundamental frequency, and estimating a pulserate from at least the first group.

Regarding Claim 37, Corenman does not teach or suggest an apparatus for monitoring physiological parameters of a living organism having a pulserate with means for producing a time-domain plethysmograph waveform, means for transforming the time-domain plethysmograph waveform into a spectral domain waveform having a fundamental spectral peak corresponding to the pulserate and two or more ancillary spectral peaks, and classifying the fundamental spectral peak and the ancillary spectral peaks to estimate the pulserate.

Regarding Claim 38, Corenman does not teach or suggest a physiological monitor for monitoring a living being having a pulserate, the monitor having a signal processor configured to transform a time-domain plethysmograph dataset into a spectral-domain dataset, classify spectral lines in the spectral-domain dataset into a group of spectral values corresponding to a fundamental and two or more harmonics of the fundamental, and estimate a pulserate from the group of spectral values according to one or more rules.

Regarding Claim 39, Corenman does not teach or suggest a physiological monitor having a signal processor configured to transform a time-domain plethysmograph dataset into a spectral-domain dataset, classify at least three spectral lines in the spectral-domain dataset into a group of spectral values corresponding to a first group of one or more spectral lines and at least one second group of spectral lines, the second group of spectral lines including at least one harmonic of the first group, and estimate the pulserate from the first group and at least one of the second group.

Regarding Claim 45, Corenman does not teach or suggest a physiological monitor for monitoring including a signal processor configured to transform a time-domain representation of a plethysmograph waveform into a spectral-domain representation of the plethysmograph waveform, the spectral-domain representation having at least three spectral peaks, select a selected portion of the spectral-domain representation based on one or more rules relating to characteristics of spectral lines in the selected portion and one or more harmonics of spectral lines in the selected portion, and estimate the pulserate from the selected portion of the spectral-domain representation.

Accordingly, Applicants assert that Claims 31-33, 37-39 and 45 are in condition for allowance, and Applicants request allowance of Claims 31-33, 37-39 and 45.

Objection to Claims 34-36 and 50

The Examiner objected to Claims 34-36 as being dependent on a rejected base claim. Applicants have rewritten Claims 34 and 35 in independent form including all of the limitations of the base claim and any intervening claims. Claim 36 depends from Claim 35.

The Examiner objected to Claim 50 as being identical to Claim 49. Claim 50 has been amended to further define the nature of the rules.

In view of these amendments, Applicants assert that Claims 34-36 and 50 are in condition for allowance, and Applicants request allowance of Claims 34-36 and 50.

Summary

The Examiner has indicated that Claims 40-44, 47-49, 51 and 52 are allowable. Applicants respectfully assert that Claims 31-52 are in condition for allowance, and Applicants request allowance of Claims 31-52. If there are any remaining issues that can be resolved by a telephone conference, the Examiner is invited to call the undersigned attorney at (949) 721-6305.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: _Sep 16, 2003_   By: _____
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